

CLAIMS

What is claimed is:

1. A compatible optical pickup apparatus comprising:

a first light module which one of records information on and reproduces information from a first optical recording medium having a first format, radiates a first beam having a first wavelength, and receives the first beam reflected from the first optical recording medium to detect an information signal and an error signal;

a second light module which one of records information on and reproduces information from a second optical recording medium having a second format different from the first format, radiates a second beam having a second wavelength different from the first wavelength, and receives the second beam reflected from the second optical recording medium to detect an information signal and an error signal;

a beam splitter disposed along paths of the first and second beams and which changes the paths of the first and second light beams;

an objective lens which condenses the first and second light beams to form a light spot on the first and second optical recording media, respectively; and

a monitoring photodetector disposed along a third light path, which receives the portions of the first and second light beams from the beam splitter so as to monitor powers of the first and second light modules.

2. The compatible optical pickup apparatus of claim 1, wherein the first light module comprises:

a first light source which emits the first beam;

a first photodetector which receives the first beam reflected from the first optical recording medium and passed through the beam splitter to detect an information signal and an error signal; and

a first hologram element which transmits the first beam so that the first beam proceeds to the beam splitter, and diffracts the reflected first beam so that the diffracted light proceeds to the first photodetector.

3. The compatible optical pickup apparatus of claim 2, wherein the second light module comprises:

a second light source which emits the second beam;
a second photodetector which receives the second beam reflected from the second optical recording medium and passed through the beam splitter to detect an information signal and an error signal; and
a second hologram element which transmits the second beam so that the second beam proceeds to the beam splitter, and diffracts the reflected second beam so that the diffracted light proceeds the second photodetector.

4. The compatible optical pickup apparatus of claim 1, wherein the beam splitter is one of a plate beam splitter with two parallel surfaces and a wedge beam splitter with two oblique surfaces.

5. The compatible optical pickup apparatus of claim 4, wherein the beam splitter is a wedge beam splitter having an incident surface which is inclined at an angle of θ_1 to an optical axis of the first beam to transmit the first beam, and an emitting-reflecting surface which is inclined at an angle of θ_2 to the incident surface to transmit the first beam and reflect the second beam, wherein $0^\circ \leq \theta_2 \leq 5^\circ$.

6. The compatible optical pickup apparatus of claim 4, wherein the beam splitter is a wedge beam splitter having an emitting-reflecting surface coated by a coating which causes the emitting-reflecting surface to one of transmit or reflect incident light based on wavelength, and wherein the emitting-reflecting surface transmits the first beam and reflects the second beam according to the first wavelength and the second wavelength, respectively.

7. The compatible optical pickup apparatus of claim 1, further comprising first and second collimating lenses which are respectively disposed on an optical path between the first light module and the beam splitter and an optical path between the second light module and the beam splitter.

8. The compatible optical pickup apparatus of claim 7, wherein a cross-sectional area of the light transmitted by the beam splitter is adjustable by varying a distance between the first and second light modules and the first and second collimating lenses, respectively.

9. The compatible optical pickup apparatus of claim 1, further comprising a first mirror disposed on an optical path between the first light module and the beam splitter, which reflects the first beam emitted from the first light module so that the path of the first beam is changed and the phase of the first beam is shifted.

10. The compatible optical pickup apparatus of claim 9, wherein the first mirror is coated with a coating which shifts the phase of the first beam so as to invert a polarization of the first beam.

11. The compatible optical pickup apparatus of claim 1, further comprising a second mirror disposed on an optical path between the beam splitter and the objective lens which and reflects the first and second beams emitted from the first and second light modules so that the paths of the first and second beams are changed and phases of the first and second beams are shifted.

12. The compatible optical pickup apparatus of claim 11, wherein the second mirror is coated with a coating which shifts the phase of the second beam so as to invert a polarization of the second beam.

13. The compatible optical pickup apparatus of claim 1, wherein optical output of the first and second light modules is controlled by a controller based on the received portions of the first and second beams.

14. The compatible optical pickup apparatus of claim 1, wherein the beam splitter is a cubic beam splitter which transmits most of the first beam emitted from the first light module so that most of the first beam proceeds to the objective lens, and reflects most of the second beam emitted from the second light module so that most of the second beam proceeds to the objective lens.

15. The compatible optical pickup apparatus of claim 14, further comprising a half-wavelength plate disposed on one of an optical path between the first light module and the beam splitter and an optical path between the second light module and the beam splitter and which delays a phase of incident light to change the polarization of the incident light.

16. The compatible optical pickup apparatus of claim 14, further comprising a relay lens disposed on one of an optical path between the first light module and the beam splitter and an optical path between the second light module and the beam splitter and which changes a divergent angle of incident light.

17. The compatible optical pickup apparatus of claim 14, further comprising a collimating lens disposed on an optical path between the beam splitter and the objective lens which condenses divergent light incident from the first and second light modules to convert the divergent light into parallel light.

18. An optical pickup comprising:

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a first light module which radiates a first beam having a first wavelength along a first light path, and receives the first beam reflected from a first optical recording medium to detect an information signal and an error signal;

a second light module which radiates a second beam having a second wavelength different from the first along a second light path, and receives the second beam reflected from a second optical recording medium to detect an information signal and an error signal;

a beam splitter disposed along the first and second light paths, which changes the first and second paths so that the first and second light paths coincide downstream of the beam splitter and which reflects a portion of the first and of the second light beams along a third light path;

an objective lens disposed downstream of the beam splitter, which condenses the first and second beams to form a light spot on the first and second optical recording media, respectively,

a monitoring photodetector disposed along the third light path, which receives the portions of the first and second light beams so as to monitor powers of the first and second light modules.

19. The optical pickup of claim 18, wherein the first and second optical recording media use different formats.

20. The optical pickup of claim 18, wherein the monitoring photodetector opposes the beam splitter.

21. The optical pickup of claim 18, wherein the monitoring photodetector outputs a control signal based on the monitored powers of the first and second light beams which is usable to control the output of the first and second light modules.

22. A method of recording and/or reproducing information, comprising:
radiating a first beam having a first wavelength and a second light beam having a second wavelength different from the first;
receiving the first beam reflected from a first optical recording medium and the second light beam reflected from a second optical recording medium to detect information and error signals;
changing the light paths of the first and second beams; and
forming a light spot on the first and second optical recording media by condensing the first and second beams, respectively,
wherein the first optical recording medium has a first format and the second optical recording medium has a second format different from the first.